



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,175	01/17/2007	Michinari Miyagawa	09871/0205474-US0	5398
7278	7590	05/11/2009		
DARBY & DARBY P.C. P.O. BOX 770 Church Street Station New York, NY 10008-0770			EXAMINER ROBINSON, ELIZABETH A	
			ART UNIT 1794	PAPER NUMBER
			MAIL DATE 05/11/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/599,175	<b>Applicant(s)</b> MIYAGAWA ET AL.	
	<b>Examiner</b> Elizabeth Robinson	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9-21-2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Specification*

The disclosure is objected to because of the following informalities: In the discussion of Figure 2 in the second line of page 11 of the specification, there appears to be a typographical error. The paper is referred to as “wound-free”. All other descriptions in the specification (Paragraphs 17 and 59) refer to the paper as “wood-free.”

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 2, 3, 5, 8, 11-14, 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Regarding claims 3 and 8, the equations presented cannot be solved. In particular:

$$0 < A < 0.4 \times (1 - B) \text{ and } A + B = 1.$$

Substituting, results in the equation:

$0 < A < 0.4 \times (1 - (1 - A))$ , which simplifies to  $0 < A < 0.4 \times A$  for which there are no solutions. Further, the examples in Table 1 of the instant specification all have a volume filling fraction of the graphite powder (B) of greater than or equal to 0.5. Thus, it

Art Unit: 1794

is unclear if there is some other error to the equations presented. Claims 13 and 14 depend from claim 3 and thus, are also rendered indefinite.

Claim 2 recites the limitation "the conductive thermoplastic-resin film A" in line 2. There is insufficient antecedent basis for this limitation in the claim. There is no film A in claim 1 from which this claim depends. Claims 8, 11 and 12 depend from claim 2 and thus, are also rendered indefinite.

Claim 3 recites the limitation "the conductive thermoplastic-resin film A" in line 4. There is insufficient antecedent basis for this limitation in the claim. There is no film A in claim 1 from which this claim depends. Claims 13 and 14 depend from claim 3 and thus, are also rendered indefinite.

Claim 5 recites the limitation "the conductive thermoplastic-resin film B" in line 2. There is insufficient antecedent basis for this limitation in the claim. There is no film B in claim 1 from which this claim depends. Claims 17 and 18 depend from claim 5 and thus, are also rendered indefinite.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by**

**Sakamoto et al. (JP 2002-124265).** A machine translation of this document is provided

Art Unit: 1794

with this Office Action. A formal English translation will be provided with the next Office Action.

Sakamoto (Paragraphs 6-8) teaches a conductive resin sheet comprising a thermoplastic resin and conductive particles. The volume resistivity and moisture permeability of the sheet are measured in the claimed manner (Paragraphs 31 and 32). The moisture permeability (Paragraph 12) can be as low as  $1\text{g}/(\text{m}^2\cdot\text{day})$ . The volume resistivity is preferably  $10\text{ ohm}\cdot\text{cm}$  or less (Paragraph 13).

### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 2 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sakamoto et al. (JP 2002-124265).**

As stated above, Sakamoto teaches a film that meets the limitations of claim 1. Sakamoto (Paragraph 14) teaches that there can be one or more kinds of conductive particles and that the preferred carbon particles are carbon black and graphite. The particle size of the conductive particles is preferably 0.01 to 10 microns, preferably 0.05 to 5 microns from the point of view of dispersibility in the thermoplastic resin (Paragraph 15).

Sakamoto does not explicitly teach the average particle diameter of the graphite.

However, since the preferred particle size range overlaps the range of the instant claim and given that the average particle size would necessarily have to fall within this particle size range, the average particle diameter either meets this range or alternately it would be obvious to one of ordinary skill in the art to choose a particle size to obtain a desired degree of dispersibility in the thermoplastic resin.

***Claim Rejections - 35 USC § 103***

**Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (JP 2002-124265), in view of Matsubara et al. (US 2004/0041536).**

As stated above, Sakamoto teaches a conductive film that meets the claimed volume resistivity of claims 4 and 6 and the claimed moisture permeability of claim 6. The thermoplastic resin is present at 40 to 85 weight % of the film (Paragraph 13) and can be a polypropylene copolymer (Paragraph 22). The film can be used as the conductive resin sheet for a lead storage battery or other more detailed cell electrodes (Paragraph 1). The conductive resin sheet adheres due to the thermoplastic resin to the electrode active material (Paragraph 21) or can be adhered to a second conductive resin sheet (Paragraphs 23-26).

Sakamoto does not explicitly teach an amorphous propylene copolymer as the thermoplastic resin.

Matsubara (Paragraph 19) teaches a battery electrode with a binder that comprises an amorphous polypropylene / C<sub>2</sub> to C<sub>8</sub> olefin copolymer. The particular

Art Unit: 1794

binder provides superior adhesion for the layers of the electrode (Paragraphs 21-22) to increase cell life.

It would be obvious to one of ordinary skill in the art to use the binder of Matsubara as the binder of Sakamoto, in order to increase the adhesion of the layers of the electrode, in order to increase cell life of the battery.

The film of Sakamoto, using the binder of Matsubara to ensure layer adhesion, would have the same binder in the same amount as in the instant application and thus, would intrinsically meet the claimed peel strength limitations.

**Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa et al. (US 6,671,165), in view of Sakamoto et al. (JP 2002-124265).**

Nakazawa (Column 3, lines 40-54) teaches an electric double layer capacitor comprising electrodes and collectors. The collectors are formed from copper foil (Column 4, lines 20-26). It is desired that the collector has a low degree of gas permeability (Column 1, lines 44-50).

Nakazawa does not teach the collector as being formed from the film of claims 1 or 2.

Sakamoto (Paragraphs 3-5) teaches that a metallic foil of a cell electrode can be replaced by a conductive resin sheet, in order to make the cell lighter and to increase lifespan due to the elimination of corrosion. The conductive resin sheet has a low vapor permeability (Paragraph 12). As stated above, the film of Sakamoto meets or can be obviously modified to meet the limitations of claims 1 and 2.

It would be obvious to one of ordinary skill in the art to use the film of Sakamoto, as the collector of Nakazawa, in order to form a lighter weight capacitor with an increased lifespan, while still maintaining a low vapor permeability.

**Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurosaki et al. (US 2002/0073534), in view of Sakamoto et al. (JP 2002-124265).**

Kurosaki (abstract) teaches a proton-ion polymer battery. The battery should be lightweight (Paragraph 4). The electrodes comprise a current collector that is can be formed from an electroconductive rubber and a metal plate and should minimize liquid permeability (Paragraphs 53 and 54).

Kurosaki does not teach the collector as being formed from the film of claims 1 or 2.

Sakamoto (Paragraphs 3-5) teaches that a metallic foil of a cell electrode can be replaced by a conductive resin sheet, in order to make the cell lighter and to increase lifespan due to the elimination of corrosion. The conductive resin sheet has a low vapor permeability (Paragraph 12). As stated above, the film of Sakamoto meets or can be obviously modified to meet the limitations of claims 1 and 2.

It would be obvious to one of ordinary skill in the art to use the film of Sakamoto, as the collector of Kurosaki, in order to form a lighter weight capacitor with an increased lifespan, while still maintaining a low vapor permeability.



**Claims 15, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa et al. (US 6,671,165), in view of Sakamoto et al. (JP 2002-124265) and Matsubara et al. (US 2004/0041536) as applied to claims 4-6 above.**

Nakazawa (Column 3, lines 40-54) teaches an electric double layer capacitor comprising electrodes and collectors. The collectors are formed from copper foil (Column 4, lines 20-26). It is desired that the collector has a low degree of gas permeability (Column 1, lines 44-50).

Nakazawa does not teach the collector as being formed from the film of claims 4, 5 or 6.

Sakamoto (Paragraphs 3-5) teaches that a metallic foil of a cell electrode can be replaced by a conductive resin sheet, in order to make the cell lighter and to increase lifespan due to the elimination of corrosion. The conductive resin sheet has a low vapor permeability (Paragraph 12). As stated above, the film of Sakamoto, using the binder of Matsubara to ensure layer adhesion, meets the limitations of claims 4-6.

It would be obvious to one of ordinary skill in the art to use the film of Sakamoto, using the binder of Matsubara to ensure layer adhesion, as the collector of Nakazawa, in order to form a lighter weight capacitor with an increased lifespan, while still maintaining a low vapor permeability.

**Claims 16, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurosaki et al. (US 2002/0073534), in view of Sakamoto et al.**

Art Unit: 1794

**(JP 2002-124265) and Matsubara et al. (US 2004/0041536) as applied to claims 4-6 above.**

Kurosaki (abstract) teaches a proton-ion polymer battery. The battery should be lightweight (Paragraph 4). The electrodes comprise a current collector that is can be formed from an electroconductive rubber and a metal plate and should minimize liquid permeability (Paragraphs 53 and 54).

Kurosaki does not teach the collector as being formed from the film of claims 4, 5 or 6.

Sakamoto (Paragraphs 3-5) teaches that a metallic foil of a cell electrode can be replaced by a conductive resin sheet, in order to make the cell lighter and to increase lifespan due to the elimination of corrosion. The conductive resin sheet has a low vapor permeability (Paragraph 12). As stated above, the film of Sakamoto, using the binder of Matsubara to ensure layer adhesion, meets the limitations of claims 4-6.

It would be obvious to one of ordinary skill in the art to use the film of Sakamoto, using the binder of Matsubara to ensure layer adhesion, as the collector of Kurosaki, in order to form a lighter weight capacitor with an increased lifespan, while still maintaining a low vapor permeability.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP 2002-008665 discloses a conductive thermoplastic resin film, however, JP 2002-008665 is cumulative to the rejections of record.

Art Unit: 1794

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Robinson whose telephone number is (571)272-7129. The examiner can normally be reached on Monday- Friday 8 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. R./  
Elizabeth Robinson  
Examiner, Art Unit 1794

May 6, 2009

/Callie E. Shosho/  
Supervisory Patent Examiner, Art Unit 1794